Spacecraft Power Management Software for the New Millennium

By Peter R. Glück

Automation and Control Section
Jet Propulsion Laboratory
California Institute of Technology

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ABSTRACT

The Jet Propulsion Laboratory's (JPL's) New Millennium Program (NMP) is a proving ground for 21st century spacecraft technologies. Chief among these technologies is the field of spacecraft automation. The NMP Deep Space One (DS1) mission will have the most sophisticated autonomous software ever flown on robotic spacecraft. An important element of this software is the Power Management System. Since power is a system resource, this software spans many mission and spacecraft systems. It must predict future spacecraft power generation, plan activities within expected power resources, query on-board navigation and attitude control systems for position and attitude information (which impact solar power generation), monitor and analyze power system state and health, and diagnose and respond to power system failures and emergencies. This paper describes the DS1 Power Management System and its role in the DS1 autonomy software.